RANGE CREEK FIELD STATION: THE ARCHAEOLOGY OF "PLACE"

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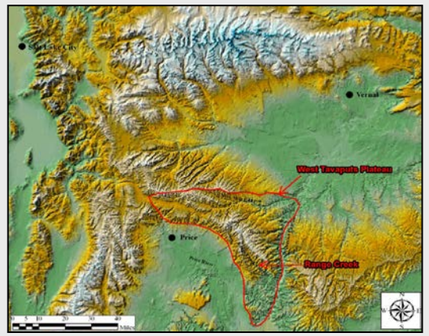


The Place

For archaeologists with strong quantitative and ecological orientations, field stations provide the opportunity for the long-term study of the past in a defined place. The Range Creek Field Station is one such place. It is a 3,000 acre field station in the heart of about 50,000 acres of very remote public lands in central Utah. Largely owned by the Utah School and Institutional Trust Lands Administration and managed by the Natural History Museum of Utah at the University of Utah, the field station provides a stable base for exploring questions about prehistoric adaptations to arid environments.

Range Creek heads at Bruin Point at an elevation of 3,110 m (10,200 ft) in a series of springs, and then flows about 38 km south-southeast to the Green River at 1,280 m (4,200 ft). As such, Range Creek Canyon contains every major ecological community in this part of the world. It is a relatively small canyon with an impressive average elevation gradient. The creek meanders between the toes of the long ridges that extend downward from surrounding high plateaus, in places poised 3,000 feet above the canyon floor. Range Creek Canyon is the poster child for natural diversity.

Range Creek has a remarkable archaeological record related to the Fremont archaeological complex. Because of its rugged and remote location, and because the previous landowners were quite protective of their private property rights, the archaeological sites in the canyon are largely untouched by anything other than time. The site density is high: to date, 470 sites have been recorded in and around the field station. The field station provides continued protection to these archaeological resources through active management and enhanced security.

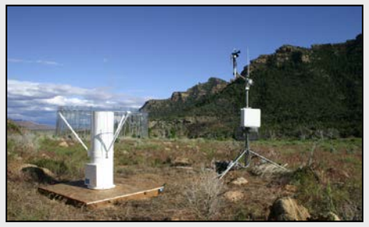
Place: A Matter of Relevance

As archaeologists, we are always attempting to reconstruct the environmental and social setting exploited by the prehistoric people we are studying. Accomplishing this typically consists of two steps: characterizing the variation in the modern environment and then recasting that characterization into the relevant past. Characteristics of the modern environment include climate, distribution of flora and fauna, geology, and hydrology. Proxies used for reconstructing past environments include pollen and other plant microfossils, plant macrofossils, sediment characteristics, vertebrate and invertebrate faunal remains, geomorphology, and dendroclimatology.

Archaeologists typically have to reach far and wide to assemble these data and consequently their relevance and accuracy for a particular place is always at least a bit uncertain and rarely quantifiable. This is especially true in the Intermountain West due to its incredible elevation, topographic and environmental diversity. Everyone does the best that they can. Weather data are culled from neighboring towns and cities, small-scale maps of plant communities for the region are examined, the analysis of a sediment core recovered 50 km distant is examined, and perhaps the climatic reconstructions available in the North American Drought Atlas are consulted. What these data tell us about the precise locations we are interested in is always matter of considerable speculation. Generally the arguments of relevance focus on spatial proximity and environmental similarities.

Field stations provide the opportunity to conduct the modern characterizations and paleoenvironmental reconstructions in the area of interest, therefore ensuring their relevance. They take time, resources and effort, but results are cumulative. Clearly, if analyzing one sediment core from the field station is good, multiple samples from different settings across the canyon are even better.

We have established two recording weather stations at the field station, one at the north end, the other towards the south end. Our goal is to describe and ultimately understand the variability in weather within the canyon, as well as year-to-year variation. These weather stations record wind speed and direction, atmospheric pressure, precipitation, humidity, temperature and solar radiation. Beginning last year, ten manual precipitation gauges were spread along the length of the field station to better understand the spatial characteristics of summer storms in the canyon. Beginning next year, we will begin to collect data on the stream flow characteristics of Range Creek along its length and annual variation.



Field stations are also perfect settings for conducting experiments. Hunter-gatherers only exploit a subset of available resources. We can use the information in ethnographies of local American Indian tribes as one clue to the importance of particular resources. We can also quantitatively study the benefits and costs of exploiting different resources in different ecological settings through experiments. We began "handling" experiments for two wild plant resources last year and we will broaden the targeted species in the future.

Not all parts of the canyon bottom are likely to be equally profitable with respect to farming. Different parts of the canyon receive different levels of precipitation, some have different soil characteristics, some are easier to irrigate than others. Again, the consequence of this variation can best be documented through experimental gardens in different areas over a number of years (with weather and stream flow data for those years).

Field stations provide a secure setting for preserving archaeological sites and conducting long-term observations. It is possible to initiate studies that will truly only bear fruit after a decade, or decades, of data collection. All of the studies enumerated here are cumulative—their total contribution is clearly greater than the sum of their individual results.

Place: A Matter of Time

All archaeological investigations run into hurdles: lack of organic material to date, poor stratigraphy, features of unknown function, damage due to burrowing rodents, and a host of others. Typically these hurdles are acknowledged, described and accepted. With a long-term research program, these hurdles can be overcome with additional work that contributes not only to better understanding the prehistoric occupation in question, but also to the development of archaeological method and theory.

Three examples suffice to make this point. First, radiocarbon dating the sediments in Range Creek has produced wildly erratic results. This is the consequence of bitumen and kerogen contamination from highly carboniferous deposits higher in the canyon. Varying amounts of this "dead" carbon makes radiocarbon dating highly unreliable in these contexts, contexts important for a lot of paleoenvironmental research. We have returned to these sedimentary deposits and collected samples for OSL dating which is unaffected by this form of contamination. We are also exploring techniques for recovering cores that are amenable to direct OSL dating.

Radiocarbon dating of cultural material suffers from a different problem—the dates are too tight in time to allow dividing the Fremont occupation into temporal segments. This is the consequence of both the character of the Fremont occupation and the fact that it falls within a very "poorly behaved" portion of the radiocarbon calibration curve (one with multiple intercepts). Traditional dendrochronology has not proven particularly useful because of the small size of timbers used in architectural features. Ryan Bares, a graduate student in geography, is exploring the possibilities for developing new master tree-ring sequences that are based on tree-ring thickness and stable carbon isotope values. We anticipate that by utilizing several dimensions of variability, unique matches can be arrived at with shorter ring sequences.

Joan Coltrain and colleagues are examining the stable isotopes in the soils of Range Creek. This technique enables researchers to identify buried corn fields due to their positive departure in 13C when compared to other areas and other levels within the same area. Further study may allow this technique to be used to examine variation in the intensity of prehistoric farming along the canyon floor.

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